In the Claims

Please amend the claims as follows:

1. (Cancelled)

2. (Cancelled)

3. (Currently amended) A method for needleless injection of a liquid substance ~~in the skin or other target tissue of a patient~~ as defined in claim 36, ~~comprising~~ wherein accelerating the droplets of the liquid substance comprises:

~~producing~~ generating a high velocity jet of gas;

~~producing droplets of the liquid substance and~~ supplying the droplets of liquid substance into the high velocity jet of gas;

conveying the droplets of liquid substance within the high velocity jet of gas; and

guiding the ~~high velocity~~ jet of gas toward the surface of the ~~patient's skin or other~~ target biological tissue ~~in order to inject~~ for injecting the conveyed droplets of liquid substance ~~in~~ into the ~~patient's skin or other~~ target biological tissue.

4. (Currently amended) A method for needleless injection of a liquid substance as defined in claim 3, wherein ~~producing a~~ generating the high velocity jet of gas comprises:

supplying pressurized gas from a gas reservoir to a convergent-divergent.

5. (Currently amended) A method for needleless injection of a liquid substance as defined in claim 3, wherein ~~producing a~~ generating the high velocity jet of gas comprises:

supplying pressurized gas from a gas reservoir to a convergent.

6. (Currently amended) A method for needleless injection of a liquid substance as defined in claim 3, wherein ~~a~~ generating the high velocity jet of gas comprises generating a jet of inert gas.

7. (Currently amended) A method for needleless injection of a liquid substance as defined in claim 3, wherein ~~producing~~ generating the droplets of the liquid substance ~~and supplying the droplets of liquid substance in the high velocity jet of gas comprise:~~

~~introducing liquid substance in a liquid reservoir;~~

~~pressurizing the liquid reservoir to force~~ comprises forcing the liquid substance from the liquid reservoir through a perforated membrane ~~to thereby produce a jet of liquid substance which is transformed into the droplets of liquid substance; and~~

~~supplying the droplets of liquid substance in the high velocity jet of gas~~ comprising said at least one micro-orifice.

8. (Currently amended) A method for needleless injection of a liquid substance as defined in claim ~~7~~ 36, wherein pressurizing the liquid reservoir comprises:

supplying pressurized gas from a gas reservoir to the liquid reservoir.

9. (Currently amended) A method for needleless injection of a liquid substance as defined in claim ~~7~~ 3, wherein ~~guiding the high velocity jet of gas~~ comprises:

generating the droplets of the liquid substance comprises forcing the liquid substance from the liquid reservoir through a perforated membrane comprising said at least one micro-orifice; and

guiding the high velocity jet of gas comprises guiding the flow of the high velocity jet of gas along a face of the perforated membrane on a side of the perforated membrane opposite to the liquid reservoir, whereby the jet of the liquid substance ~~forced through the perforated membrane~~ and the resulting ~~jet and~~ droplets of the liquid substance are supplied ~~directly~~ within the high velocity jet of gas.

10. (Currently amended) A method for needleless injection of a liquid substance as defined in claim 3, comprising ~~producing~~ generating the high velocity jet of gas prior to ~~producing~~ generating the droplets of the liquid substance to thereby supply the droplets of the liquid substance in a steady-state high velocity jet of gas.

11. (Cancelled)

12. (Cancelled)

13. (Cancelled)

14. (Currently amended) A needleless syringe for injecting a liquid substance ~~in the skin or other target tissue of a patient~~ as defined in claim 37, ~~comprising~~ wherein:

the droplet accelerator comprises a generator of high velocity jet of gas; ~~and~~

~~a generator of droplets supplied with the liquid substance;~~

~~wherein:~~

the generator of the droplets of the liquid substance comprises an outlet for supplying the droplets of the liquid substance ~~in~~ into the high velocity jet of gas, whereby the droplets of the liquid substance are conveyed within the high velocity jet of gas; and

the generator of high velocity jet of gas comprises a channel for guiding the high velocity jet of gas toward the surface of the ~~patient's skin or other~~ target biological tissue to thereby inject the conveyed droplets of the liquid substance ~~in the patient's skin or other~~ into the target biological tissue.

15. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 14, wherein the generator of high velocity jet of gas comprises:

a convergent-divergent having an inlet; and

a pressurized gas supply connected to the inlet of the convergent-divergent to supply pressurized gas to the convergent-divergent and thereby ~~produce~~ generate the high velocity jet of gas.

16. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 15, wherein the pressurized gas supply comprises:

a reservoir of pressurized gas; and

a valve interposed between the reservoir of pressurized gas and the inlet of the convergent-divergent to controllably supply pressurized gas from the reservoir of pressurized gas to the inlet of the convergent-divergent and thereby ~~produce~~ generate the high velocity jet of gas.

17. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 14, wherein the generator of high velocity jet of gas comprises:

a convergent having an inlet; and

a pressurized gas supply connected to the inlet of the convergent to supply pressurized gas to the convergent and thereby ~~produce~~ generate the high velocity jet of gas.

18. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 17, wherein the pressurized gas supply comprises:

a reservoir of pressurized gas; and

a valve interposed between the reservoir of pressurized gas and the inlet of the convergent to controllably supply pressurized gas from the reservoir to the inlet of the convergent and thereby ~~produce~~ generate the high velocity jet of gas.

19. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 14, wherein the high velocity jet of gas comprises inert gas.

20. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 14, wherein the generator of the droplets of the liquid substance comprises:

~~a reservoir of the liquid substance to be injected;~~

a perforated membrane comprising the said at least one micro-orifice, the perforated membrane being interposed between the reservoir of the liquid substance and the channel for guiding the high velocity jet of gas; and

a pressurized gas supply forming part of the source of pressure and connected to the reservoir of the liquid substance to supply pressurized gas to the reservoir and force the liquid substance through the perforated membrane to thereby ~~produce~~ generate the droplets of the liquid substance supplied in the channel and, therefore, in the high velocity jet of gas.

21. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 20, wherein the pressurized gas supply comprises:

a reservoir of pressurized gas; and

a valve interposed between the reservoir of pressurized gas and the reservoir of the liquid substance to controllably supply pressurized gas from the reservoir of pressurized gas to the reservoir of the liquid substance to thereby force the liquid substance through the perforated membrane and thereby ~~produce~~ generate the droplets of the liquid substance supplied in the channel and, therefore, in the high velocity jet of gas.

22. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~

defined in claim 20, wherein the perforated membrane comprises : a metallic or polymeric membrane provided with the at least one micro-orifice.

23. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 20, wherein the generator of the high velocity jet of gas comprises:

a convergent-divergent comprising a throat through which the high velocity jet of gas travels;

wherein:

the perforated membrane is interposed between the reservoir of the liquid substance and the throat of the convergent-divergent.

24. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim ~~15~~ 14, wherein the generator of the high velocity jet of gas comprises:

a pressurized gas supply;

a convergent-divergent having an inlet; and

an intermediate chamber interposed between the pressurized gas supply of the generator of the high velocity jet of gas and the inlet of the convergent-divergent.

25. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 24, wherein the generator of the high velocity jet of gas further comprises:

a first valve interposed between the pressurized gas supply of the generator of the jet of gas and the intermediate chamber to control supply of pressurized gas from ~~the~~ said pressurized gas supply to the intermediate chamber; and

a second valve interposed between the intermediate chamber and the inlet of the convergent-divergent to control supply of pressurized gas from the intermediate chamber to the convergent-divergent.

26. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 14, wherein the generator of the high velocity jet of gas comprises:

a pressurized gas supply;

a convergent having an inlet; and

an intermediate chamber interposed between the pressurized gas supply of the generator of the high velocity jet of gas and the inlet of the convergent.

27. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 26, wherein the generator of the high velocity jet of gas comprises:

a first valve interposed between the pressurized gas supply of the generator of the high velocity jet of gas and the intermediate chamber to control supply of pressurized gas from ~~the~~ said pressurized gas supply to the intermediate chamber; and

a second valve interposed between the intermediate chamber and the inlet of the convergent to control supply of pressurized gas from the intermediate chamber to the convergent.

28. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 20, wherein the generator of the droplets of the liquid substance further comprises:

an intermediate chamber interposed between the pressurized gas supply and the reservoir of the liquid substance.

29. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 28, wherein the generator of the droplets of the liquid substance further comprises:

a first valve interposed between the pressurized gas supply and the intermediate chamber to control supply of pressurized gas from the pressurized gas supply to the intermediate chamber; and

a second valve interposed between the intermediate chamber and the reservoir of liquid ~~supply~~ substance to control supply of pressurized gas from the intermediate chamber to the reservoir of the liquid ~~supply~~ substance.

30. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 29, wherein the reservoir of the liquid substance comprises:

a liquid chamber adjacent to the perforated membrane for containing the liquid substance;

a gas-tight chamber; and

a slidable piston interposed between the liquid chamber and the gas-tight chamber; wherein:

the second valve is interposed between the intermediate chamber and the gas-tight chamber to control supply of pressurized gas from the intermediate chamber to the gas-tight chamber; and

the supply of pressurized gas to the gas-tight chamber ~~apply~~ applies a pressure on the slidable piston to compress the liquid substance in the liquid chamber and force the liquid substance through the perforated membrane to thereby ~~produce~~ generate the droplets of the liquid substance supplied in the high velocity jet of gas.

31. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 16, wherein ~~each~~ the valve is an electronic valve.

32. (Currently amended) A needleless syringe for injecting a liquid substance as ~~recited~~ defined in claim 16, wherein ~~each~~ the valve is a mechanical valve comprising elements selected from the group consisting of pistons, springs and plungers.

33. (Cancelled)

34. (Currently amended) A ~~device for~~ needleless syringe ~~injection of~~ for injecting a liquid substance ~~in the skin or other target tissue of a patient~~ as defined in claim ~~11~~ 20, comprising:

a chamber for containing the liquid substance, said chamber being delimited in part by both a the perforated membrane and a movable wall; and

means for applying pressure to the movable wall toward the chamber in order to force the liquid substance through the perforated membrane for both generating the droplets of the liquid substance, and directing the droplets of the liquid substance toward the surface of the ~~patient's skin or other~~ target tissue at a velocity sufficiently high to inject the droplets of the liquid substance ~~in the patient's skin or other~~ into the target biological tissue.

35. (Currently amended) A ~~device for~~ needleless syringe ~~injection of~~ for injecting a liquid substance ~~in the skin or other target tissue of a patient~~ as defined in claim ~~11~~ 20, comprising:

a chamber for containing the liquid substance, said chamber being delimited in part by both a the perforated membrane and a burstable membrane; and

a gas source for applying pressurized gas to the burstable membrane in order to burst said burstable membrane and, after said burstable membrane has been burst, to convey liquid substance through the perforated membrane for both generating the droplets of the liquid substance, and directing the droplets of the liquid substance toward the surface of the ~~patient's skin or other~~ target biological tissue at a velocity sufficiently high to inject the droplets of the liquid substance ~~in the patient's skin or other~~ into the target biological tissue.

36. (New) A method for needleless injection of a liquid substance into a target biological tissue, the method comprising:

generating droplets of the liquid substance;

accelerating the droplets of the liquid substance at a velocity sufficiently high to inject the droplets of the liquid substance into the target biological tissue; and

directing the droplets of the liquid substance toward a surface of the target biological tissue at the sufficiently high velocity to inject the droplets of the liquid substance into the target biological tissue;

wherein generating the droplets of the liquid substance comprises pressurizing a reservoir containing the liquid substance to force the liquid substance from the liquid reservoir through at least one micro-orifice to thereby produce a jet of the liquid substance, wherein the jet of the liquid substance transforms into a stream of the droplets.

37. (New) A needleless syringe for injecting a liquid substance into a target biological tissue, comprising:

a generator of droplets of the liquid substance for generating droplets of the liquid substance; and

a droplet accelerator for accelerating the droplets of the liquid substance toward a surface of the target biological tissue in order to inject the accelerated droplets into the target biological tissue; and

wherein the generator of droplets comprises: a reservoir of the liquid substance to be injected; at least one micro-orifice through which the liquid substance from the reservoir is supplied; and a source of pressure for pressurizing the reservoir of the liquid substance and forcing the liquid substance through the at least one micro-orifice to thereby produce a jet of the liquid substance, wherein the jet of the liquid substance transforms into a stream of the droplets.

38. (New) A needleless syringe for injecting a liquid substance as defined in claim 37, wherein the generator of the droplets of the liquid substance comprises a perforated membrane comprising the said at least one micro-orifice.